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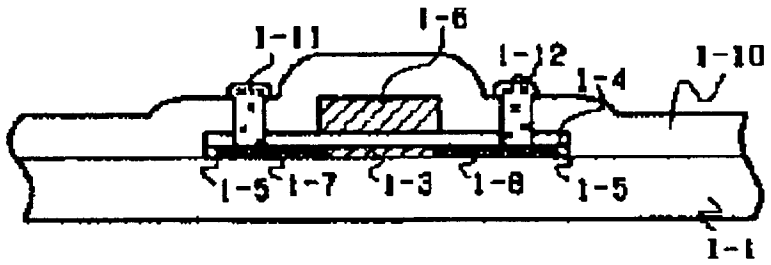
## (54) MANUFACTURE OF THIN FILM SEMICONDUCTOR DEVICE

(57) Abstract:

PURPOSE: To form a silicon film consisting of a silicon crystal of a large crystal particle diameter and the interface between oxide films, which has a small interfacial level density, by a method wherein an amorphous semiconductor thin film is formed on an insulating substrate, is heat-treated without taking out in the atmosphere

to solid-phase grow and moreover, a gate oxide film is formed and the thin film and the oxide film are patterned into an insular form in one photo process.

CONSTITUTION: An insulating substrate is installed in a chamber of a plasma CVD device, mixed gas containing monosilane (SiH4) gas, disilane (Si2H6) gas or trisilane (Si3H8) gas is introduced, an a-Si:H film 1-2 deposited by decomposition according to glow discharge and after the gas is exhausted, the air is substituted for vacuum or inert gas, the temperature in the interior of the chamber is heated up to solid-phase grow the film 1-2 and after the gas is exhausted, oxygen gas is introduced and glow discharge is performed, whereby the surface of the film 1-2 is oxidized to form a gate oxide film 1-4 and the gate oxide film and the solid-phase grown Si film are etched by a photolithography method and are patterned into an insular form in one photo process. Subsequently, the end surface of the solid-phase grown Si film is oxidized by a plasma oxidation method using the plasma CVD device.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